CLAIMS

What is claimed is:

1. A system that facilitates approximating a solution to a linear program, comprising:

a component that receives a subset of data corresponding to the linear program; and

an analysis component that adapts linear programming optimization algorithms, based on separation oracle(s), to work with an approximate separation oracle and the subset of data to solve a primal and dual linear program within a same approximation factor as the approximate separation oracle.

2. The system of claim 1, the analysis component resolving an optimization of the dual linear program to solve for an optimization of the primal linear program.

3. The system of claim 2, the optimization of the dual linear program comprising an approximate range between R^* and αR^*; where α is the approximation factor and R^* is a minimum value produced by a binary search of an equality function produced *via* an ellipsoid algorithm utilizing the approximate separation oracle.

4. The system of claim 3, the optimization of the primal linear program comprising a value less than or equal to αR^*.

5. The system of claim 1, the approximate separation oracle comprising an approximation algorithm for a minimum Steiner tree problem.

6. The system of claim 1, the approximate separation oracle utilized in conjunction with an ellipsoid method to obtain a resolution for the primal and dual linear programs.

7. The system of claim 6, the resolution producing an approximation algorithm for a fractional Steiner tree packing problem.

8. The system of claim 1, the analysis component utilizing primal and dual linear programs representative of a fractional Steiner tree packing problem.

9. The system of claim 1, the primal linear program comprising a representation of an aspect of at least one computer network system.

10. The system of claim 1, the subset of data comprising parametric data of a networked system.

11. The system of claim 10, the parametric data comprising capacity data relating to at least one link of the networked system.

12. The system of claim 10, the parametric data comprising length data relating to at least one link of the networked system.

13. The system of claim 10, the parametric data comprising cost data relating to at least one link of the networked system.

14. The system of claim 10, the parametric data comprising latency data relating to at least one link of the networked system.

15. The system of claim 1, the analysis component has an asymptotic approximation factor of about 1.59.

16. A method for approximating a distribution optimization, comprising:

obtaining desired parameter data from a networked system for utilization in determining an optimum distribution; and

determining the optimum distribution utilizing an approximate separation oracle in an ellipsoid method to solve primal and dual linear programs that represent a fractional Steiner tree packing problem.

17. The method of claim 16, further comprising:

obtaining the primal linear program for Steiner trees in the networked system;

determining the dual linear program based on the primal linear program; where a separation oracle of the dual linear program equates to a Steiner tree problem which is NP-hard to solve;

selecting a known approximation method for resolving a minimum weight Steiner tree problem;

utilizing the known approximation method as the approximate separation oracle in the ellipsoid method to provide a resolution to the dual linear program; and

employing the resolution of the dual linear program to provide a solution for the primal linear program to facilitate in finding an approximate maximum fractional packing of the Steiner trees in the networked system.

18. The method of claim 17, the known approximation method comprising a polynomial time α -approximation algorithm for finding the minimum weight Steiner tree.

19. The method of claim 18, further comprising:

employing a binary search to find a smallest value of R for which the dual linear program is feasible; where R represents a solution to the ellipsoid method utilizing the approximate separation oracle;

solving the dual linear program such that R^* is a minimum feasible solution and αR^* is a maximum feasible solution; where α is a performance factor of the approximate separation oracle;

setting the solution for the primal linear program equal to $\leq \alpha R^*$; and

providing an approximated optimization solution for the maximum fractional packing of the Steiner trees based on the solution for the primal linear program.

20. The method of claim 16, the approximate separation oracle having a performance ratio within approximately a 1.6 factor.

21. The method of claim 16, the networked system comprising a computer network.

22. The method of claim 21, the computer network comprising the Internet.

23. The method of claim 16, the desired network parameters including at least one from the group consisting of cost, length, capacity, and latency of links in the networked system.

24. The method of claim 16, further comprising:

utilizing the optimum distribution to efficiently transmit non-streaming data from a source node to a receiving node *via* the networked system.

25. The method of claim 16, the optimum distribution incorporating a broadcast transmission by the source node.

26. The method of claim 16, the optimum distribution incorporating a multicast transmission by the source node.

27. The method of claim 16, the optimum distribution incorporating a unicast transmission by the source node.

28. A system that facilitates approximating a solution to a linear program, comprising:

means for approximating an algorithmic solution to a minimum weight Steiner tree problem;

means for obtaining an approximate separation oracle for the algorithmic solution; and

means for utilizing the approximate separation oracle in an ellipsoid method to resolve primal and dual linear programs representative of a fractional Steiner packing tree problem to provide an optimal distribution for a networked system.

29. The system of claim 28, the networked system comprising at least one computer network.

30. A system that facilitates broadcast of non-streaming data, comprising:

a component that receives a subset of broadcast data; and

an approximation component that facilitates routing the subset of data, the approximation component employs a generalized ellipsoidal algorithm that works with an approximate separation oracle to solve a primal and dual linear program within a same approximation factor as the approximate separation oracle.

31. A data packet transmitted between two or more computer components that facilitate dissemination of data, the data packet comprising, at least in part, information relating to optimizing distribution on at least one networked system, the optimized distribution based on an approximated optimization solution for a primal linear program resolved utilizing a same separation oracle employed to determine feasibility of a dual linear program representative of the primal linear program.

32. A computer readable medium having stored thereon computer executable components of the system of claim 1.

33. A device employing the method of claim 16 comprising at least one selected from the group consisting of a computer, a server, and a handheld electronic device.

34. A device employing the system of claim 1 comprising at least one selected from the group consisting of a computer, a server, and a handheld electronic device.